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| 10/658,021 | 09/09/2003 | Joseph Bibb Cain | GCSD-1469 (51335) | 2804 |

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| EXAMINER | |
|---|---|
| ELALLAM, AHMED | |
| **ART UNIT** | **PAPER NUMBER** |
| 2616 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

creganoa@addmg.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/658,021 | CAIN ET AL. | |
| | Examiner | Art Unit | |
| | AHMED ELALLAM | 2616 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-3,5-7,9-17,19-26 and 28-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-7,9-17,19-26 and 28-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

This office action is responsive to Amendment after final filed on 10/29/2007. The Amendment has been entered. However the allowability of claims 1-3, 5-7, 9-217, 19-26, and 29-31 has been withdrawn in view of further consideration of the prior art of records as indicated hereinafter.

### *Claim Objections*

1. Claim 1 is objected to because of the following informalities:

In claim 1, the phrase "the at least one selected route" lack antecedent basis.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 5-7, 9-13, 24, 26, 28-30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tasman et al, US 2002/0080755 A1 in view of Fong et al, US 2004/0013102. Hereinafter, respectively referred to as Tasman and Fong.

Regarding claims 1 and 24, Tasman discloses a mobile ad hoc network (MANET), see paragraph [0004] comprising:

a plurality of mobile nodes (see figure 1) each comprising a transceiver, see figure 2 and paragraph [0042], (claimed a wireless communications device providing a selectable signal transmission pattern), connected to CPU (unit 3, figure 2) also referred to as a processor, see abstract (claimed controller connected thereto), the processor in multi-layered architecture (paragraph [0046]), for a given application having a type of service, the processor (i) selects a routing manager from among a plurality of routing managers based at least in part on a type-of-service or quality of service (QoS) indicator of a message packet to be transmitted, see paragraph [0013], [0014] and [0017], (claimed at an upper protocol layer, establishing a quality-of-service (QoS) threshold); selecting a unicast or multicast manager based on the type of service (TOS) at a forwarding layer 17, see figure 3b and paragraph [0119], (claimed at least one intermediate protocol layer below the upper protocol layer, selecting between a unicast communications mode and a multicast communications mode based upon the QoS threshold), Tasman further discloses each layer communicates with the layer above and/or below it, wherein a lower radio layer 10 (e.g., a MAC/Modem Layer) sends and receives packets via the transceiver 6, see paragraph [0046], (claimed and at a lower protocol layer below the at least one intermediate protocol layer, cooperating with (as in claim 1) or causing (as in claim 24), the wireless communications device to transmit data to at least one destination mobile node based upon the selected communications mode). Tasman further discloses, with reference to figure 3b, a routing manager (the

manager in connection with the Forwarding layer reads on the claimed intermediate layer) via the link metric calculator 11 (the link metric cooperating with the radio layer that corresponds to the claimed lower layer) may determine that a radio transmission in a particular network arrangement requires a minimum power level of 10 dBm. The routing manager could then update corresponding radio parameters to reflect this requirement. See paragraph [0051]. Tasman also discloses the forwarding layer identifies a destination address, and use it to index into a next-hop table associated with a forwarding table, see paragraph [0088]. (Claimed at the at least one intermediate protocol layer, selecting at least one route to at least one destination node). (Claimed at the lower protocol layer, said controller cooperates with said wireless communications device to determine a QoS metric for at least one selected route; and wherein, at the at least one intermediate protocol layer, said controller determines whether the QoS metric falls below the QoS threshold and claimed at the lower protocol layer, said controller cooperates with said wireless communications device to change (or adjust as in claim 24) at least one signal characteristic based upon a determination that the QoS metric has fallen below the QoS threshold)

Tasman doesn't specify the transceiver (claimed wireless communications device) modulate or modulating the data using a first modulation technique if the QoS metric is greater than or equal to the QoS threshold, and otherwise uses a second modulation technique.

However, Fong discloses in the same field of endeavor of wireless communications networks, a QoS sublayer that operates to provide adaptive modulation and/or coding. See [0040]. (Claimed modulate the data using a first modulation technique if the QoS metric is greater than or equal to the QoS threshold, and otherwise uses a second modulation technique).

Therefore, It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to implement the functionality of the adaptive modulation and/or coding as taught by Fong at a layer below the application layer of Tasman (i.e. forwarding layer 17) so that coding and modulation can be selectively chosen based on source to destination route conditions. The advantage would be the ability of Tasman to adapt to various changes that occurs during data transmission. Such adaptive technique would also be advantageous for providing reliable data transmission and better utilization of bandwidth in the network of Tasman.

Regarding claims 3 and 26, Tasman discloses a processor as discussed above with reference to claims 1 and 24, Tasman further disclose the radio layer 10 can positively or negatively acknowledge a transmission of a packet by sending a message (e.g., "ACK" or "NAK") to the forwarding layer 17. (Claimed at the at least one intermediate protocol layer, said controller determines whether to require data reception acknowledgements based upon the QoS threshold).

Regarding claims 5, and 28, with reference to figure 3b, Tasman discloses a routing manager (the manager in connection with the Forwarding reads on the claimed

intermediate layer) via the link metric calculator 11 (the link metric cooperating with the radio layer that corresponds to the claimed lower layer) may determine that a radio transmission in a particular network arrangement requires a minimum power level of 10 dBm. The routing manager could then update corresponding radio parameters to reflect this requirement. See paragraph [0051]. (Claimed at the lower protocol layer, said controller cooperates with said wireless communications device to change (or adjust as in claim 28) at least one signal characteristic based upon a determination that the QoS metric has fallen below the QoS threshold (as in claims 5 and 28)).

Regarding claims 6 and 29, Tasman discloses determining that a radio transmission in a particular network arrangement requires a minimum power level, see paragraph [0051]. (Claimed the at least one signal characteristic comprises at least one of power, gain, and signal pattern).

Regarding claim 10, Tasman with the reference to figure 3b, shows an application layer above the forwarding layer. (Claimed the upper protocol layer comprises an application layer.

Regarding claim 11, with the reference to figures 3a, Tasman shows the forwarding layer, is situated above the physical layer 19, and the radio layer 10, below the application layer and radio layer, (claimed intermediate layer comprises a session layer).

Regarding claim 12, with reference to figure 3b, Tasman shows a physical layer below the forwarding layer. (Claimed the lower protocol layer comprises a physical layer).

Regarding claim 13, Tasman discloses the type of service (QoS) is based on the priority, see paragraph [0099]. (Claimed QoS threshold is based upon priority).

Regarding claims 7 and 30, Tasman discloses the mobile station uses FEC coding, see paragraph [0096], (Claimed encoding data prior to transmission). However, Tasman doesn't explicitly disclose changing the encoding based upon a determination that the QoS metric has fallen below the QoS threshold).

However, Fong discloses in the same field of endeavor of wireless communications networks, a QoS sublayer that operates to provide adaptive modulation and/or coding. See [0040]. (Claimed changing the encoding based upon a determination that the QoS metric has fallen below the QoS threshold as in claims 7 and 30) .

Therefore, It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to implement the functionality of the adaptive modulation and/or coding as taught by Fong at a layer below the application layer of Tasman (i.e. forwarding layer 17) so that coding and modulation can be selectively chosen based on source to destination route conditions. The advantage would be the ability of Tasman to adapt to various changes that occurs during data transmission.

Such adaptive technique would also be advantageous for providing reliable data transmission in the network of Tasman.

Regarding claims 9 and 32, Tasman discloses the processor selecting a data rate, see paragraph [0096], (claimed controller cooperates with said wireless communications device to transmit data at a data rate), but doesn't explicitly specify the processor (claimed controller) also cooperates with or cause said wireless communications device to change the data rate based upon a determination that the QoS metric has fallen below the QoS threshold.

However, Fong discloses a QoS layer cooperating with a lower layer for providing a rate control in accordance with given QoS. See paragraphs [0038] and [0040]. Therefore, It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to implement the functionality of rate control in accordance with given QoS levels as taught by Fong by adding the functionality of rate control to the radio layer of Tasman (claimed lower layer) so that the system of Tasman would adjust the transmission rate in accordance with the transmission medium parameters. The advantage would be for example, the control of error rates to be in conformance with the type of service requirements imposed by the running Application (TOS, Tasman).

3. Claims 2 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tasman in view Fong as applied to claim 1 above and further in view of Sholander et al, US 7,177,295. Hereinafter referred to as Sholander.

Regarding claims 2 and 25, Tasman in view of Fong discloses the forwarding layer identify a destination address, and use it to index into a next-hop table associated with a forwarding table, see Tasman paragraph [0088]. (Claimed at the at least one intermediate protocol layer, selecting at least one route to at least one destination node). Tasman also discloses radio layer 10 (e.g., a MAC/Modem Layer) sends and receives packets via the transceiver 6, see paragraph [0046], (claimed cooperating with said wireless communications device to transmit the data to the at least one destination mobile node via the at least one selected route).

Tasman in view of Fong do not explicitly disclose that the route is selected based on QoS threshold.

However, Sholander discloses in the same field of endeavor of routing in AD-HOC networks, the selection of route from a source to a destination based on QoS threshold. See Abstract.

It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to enhance the routing mechanism of Tasman in view of Fong with QoS based routing of Sholander, so that each traffic flows with a given type of service will be sent to its destination on a route that comply with preserving the service guarantees of the corresponding type of service. The advantage would be the ability to

deliver data to the destination address while observing the QoS requirements of each data traffic type in the network of Tasman in view of Fong.

4. Claims 14-17, and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tasman in view of Sholander et al, US 7,177,295 and further in view of Fong. Hereinafter referred to as Sholander.

Regarding claim 14, Tasman discloses mobile ad hoc network (MANET), see paragraph [0004] comprising:

a plurality of mobile nodes (see figure 1) each comprising a transceiver, see figure 2 and paragraph [0042], (claimed a wireless communications device providing a selectable signal transmission pattern), the transceiver connected to CPU (unit 3, figure 2) also referred to as a processor, see abstract, (claimed controller connected thereto), the processor in multi-layered architecture (paragraph [0046]), and for a given application having a type of service , the processor (i) selects a routing manager from among a plurality of routing managers based at least in part on a type-of-service or quality of service (QoS) indicator of a message packet to be transmitted, see paragraph [0013], [0014] and [0017], (claimed at an upper protocol layer, establishing a quality-of-service (QoS) threshold); selecting a unicast or multicast manager based on the type of service (TOS) at a forwarding layer 17, see figure 3b and paragraph [0119], (claimed at least one intermediate protocol layer below the upper protocol layer, selecting between a unicast communications mode and a multicast communications mode based upon the

QoS threshold), Tasman further discloses each layer communicates with the layer above and/or below it, wherein a lower radio layer 10 (e.g., a MAC/Modem Layer) sends and receives packets via the transceiver 6, see paragraph [0046], (claimed and at a lower protocol layer below the at least one intermediate protocol layer, cooperating with the wireless communications device to transmit data to at least one destination mobile node based upon the selected communications mode). Tasman further with reference to figure 3b, discloses a routing manager (the manager in connection with the Forwarding reads on the claimed intermediate layer) in connection with link metric calculator 11 may determine that a radio transmission in a particular network arrangement requires a minimum power level of 10 dBm. The routing manager could then update corresponding radio parameters to reflect this requirement. See paragraph [0051]. (Claimed at the lower protocol layer, said controller cooperates with said wireless communications device to determine a QoS metric for at least one selected route; and wherein, at the at least one intermediate protocol layer, said controller determines whether the QoS metric falls below the QoS threshold said controller cooperates with said wireless communications device to change at least one signal characteristic based upon a determination that the QoS metric has fallen below the QoS threshold). In addition, Tasman discloses the forwarding layer identifies a destination address, and use it to index into a next-hop table associated with a forwarding table, see paragraph [0088]. (Claimed at the at least one intermediate protocol layer, selecting at least one route to at least one destination node).

The difference between Tasman and claim 14 is that Tasman doesn't explicitly state that the route is selected based on QoS threshold and the transceiver (claimed wireless communications device) modulate the data using a first modulation technique if the QoS metric is greater than or equal to the QoS threshold, and otherwise uses a second modulation technique.

However, Sholander discloses in the same field of endeavor of routing in AD-HOC networks, the selection of route from a source to a destination based on QoS threshold. See Abstract.

Fong discloses in the same field of endeavor of wireless communications networks, a QoS sublayer that operates to provide adaptive modulation and/or coding. See [0040]. (Claimed changing the encoding based upon a determination that the QoS metric has fallen below the QoS threshold as in claim 17 and modulate the data using a first modulation technique if the QoS metric is greater than or equal to the QoS threshold, and otherwise uses a second modulation technique,

It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to enhance the routing mechanism of Tasman with QoS based routing of Sholander, so that each traffic flows with a given type of service will be forwarded on route that comply with preserving the service guarantees of the corresponding type of service. The advantage would be the ability to deliver data to the destination address while preserving the QoS requirements of each data traffic type.

It would have been also obvious to a person of ordinary skill in the art, at the time the invention was made to implement the functionality of the adaptive modulation and/or coding as taught by Fong at a layer below the application layer of Tasman in view of Sholander (i.e. forwarding layer 17, Tasman) so that coding and modulation can be selectively chosen based on source to destination route conditions. The advantage would be the ability of Tasman in view of Sholander to adapt to various changes that occurs during data transmission. Such adaptive technique would also be advantageous for providing reliable data transmission in the AD-HOC network of Tasman in view of Sholander in addition to the optimization of bandwidth utilization.

Regarding claim 15, Tasman discloses a processor as discussed above with reference to claim 14, Tasman further disclose the radio layer 10 can positively or negatively acknowledge a transmission of a packet by sending a message (e.g., "ACK" or "NAK") to the forwarding layer 17.

Regarding claim 16, Tasman discloses determining that a radio transmission in a particular network arrangement requires a minimum power level, see paragraph [0051]. (Claimed the at least one signal characteristic comprises at least one of power, gain, and signal pattern).

Regarding claim 17, Tasman in view of Sholander discloses the mobile station uses FEC coding, see Tasman, paragraph [0096], (Claimed encoding data prior to transmission). However, Tasman in view of Sholander does not explicitly disclose

changing the encoding based upon a determination that the QoS metric has fallen below the QoS threshold.

However, Fong discloses in the same field of endeavor of wireless communications networks, a QoS sublayer that operates to provide adaptive modulation and/or coding. See [0040]. (Claimed changing the encoding based upon a determination that the QoS metric has fallen below the QoS threshold.

Therefore, It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to implement the functionality of the adaptive modulation and/or coding as taught by Fong at a layer below the application layer of Tasman in view of Sholander (i.e. forwarding layer 17, Tasman) so that coding and modulation can be selectively chosen based on source to destination route conditions. The advantage would be the ability of Tasman in view of Sholander to adapt to various changes that occurs during data transmission. Such adaptive technique would also be advantageous for providing reliable data transmission in the AD-HOC network of Tasman in view of Sholander.

Regarding claim 19, Tasman in view of Sholander discloses the processor selecting a data rate, see Tasman, paragraph [0096], (claimed controller cooperates with said wireless communications device to transmit data at a data rate), but doesn't explicitly specify the processor (claimed controller) also cooperates with or cause said wireless communications device to change the data rate based upon a determination that the QoS metric has fallen below the QoS threshold.

However, Fong discloses a QoS layer cooperating with a lower layer for providing a rate control in accordance with given QoS. See paragraphs [0038] and [0040]. Therefore, It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to implement the functionality of rate control in accordance with given QoS levels as taught by Fong by adding the functionality of rate control to the radio layer of Tasman in view of Sholander (claimed lower layer) so that the system of Tasman/Sholander would adjust the transmission rate in accordance with the transmission medium parameters. The advantage would be for example, the control of error rates to be in conformance with the type of service requirements imposed by the running Application (TOS, Tasman).

Regarding claim 20, Tasman with the reference to figure 3b, shows an application layer above the forwarding layer. (Claimed the upper protocol layer comprises an application layer.

Regarding claim 21, with the reference to figures 3a, Tasman shows the forwarding layer, is situated above both the physical layer 19, and the radio layer 10, and below the application layer, (claimed intermediate layer comprises a session layer).

Regarding claim 22, with reference to figure 3b, Tasman shows a physical layer below the forwarding layer. (Claimed the lower protocol layer comprises a physical layer).

Regarding claim 23, Tasman discloses the type of service (QoS) is based on the priority, see paragraph [0099]. (Claimed QoS threshold is based upon priority).

***Response to Arguments***

5. The allowability of claims 1-3, 5-7, 9-217, 19-26, and 29-31 has been withdrawn for the reasons indicated above with regard to art rejections.

Applicant's arguments filed on 7/19/2007 have been fully considered but they are not persuasive.

Applicants argue that *the combination of Tasman et al. et al. and Fong et al. is improper*. Applicants alleged that QoS layer in Fong et al implemented as *a distributed layer in each base station (fixed infrastructure) and that Tasman's Wireless ad-hoc networks preferably do not rely on base stations and other fixed infrastructure*. Further Applicants argue that *Sholander et al. is also directed to an ad hoc network that is incompatible with the network of Fong et al*. Emphasis added.

Examiner respectfully disagrees, because what is relevant is the capability of QoS layer in Fong for implementing the adaptive modulation/ or coding in wireless environment regardless of the nature of the infrastructure whether fixed or ad-hoc. Further, Applicants didn't provide any rational or evidence of the alleged incompatibility between Sholander and Fong.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does

not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Examiner concludes, given the most reasonable interpretation of the claims limitations, the rejection above is proper.

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See PTO Form 892.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AHMED ELALLAM whose telephone number is (571) 272-3097. The examiner can normally be reached on 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AHMED ELALLAM
Examiner
Art Unit 2616
11/12/07

CHI PHAM
SUPERVISORY PATENT EXAMINER 11/13/07